Electricity on the Farm

A Monthly Magazine for the Progressive Rural Family

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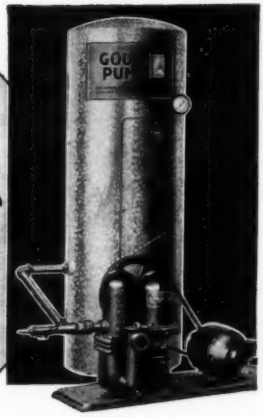

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Electricity on the Farm

Vol. 3 DECEMBER, 1930 No. 12

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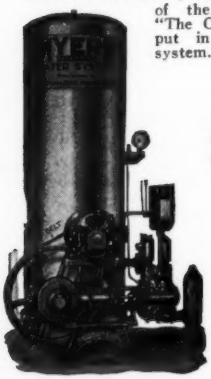

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Fig. 2510

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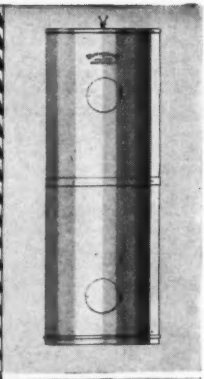

HOT WATER

at the turn of a faucet

Think how much it would mean to you to have plenty of hot water on tap—any time you wanted it—without ever again building up a fire in the kitchen stove or filling a messy oil heater.

An electric water heater will provide you with this great convenience, automatically. You can have as much hot water as you need for washing dishes, for cleaning the cream separator and milk cans, for bathing, and for all the other demands of a busy farm. And all without any work or bother on your part—or any worry about fuel, flames, or fumes.

The next time you're in town, ask your local power company or the nearest Westinghouse dealer about the complete line of Westinghouse Water Heaters and how easily a complete installation can be made for you; or write for our descriptive folder.

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Domestic Appliance Department Mansfield, Ohio

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Westinghouse

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Think about it in terms of economy—economy of labor and time and cost. Your power company will tell you all the details.

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GENERAL ELECTRIC

Electricity on the Farm

Vol. 3 DECEMBER, 1930 No. 12

Merry Christmas

TRULY, Christmas is the season of happiness and enjoyment. The companionship and mutual good-will, the reuniting of old friends, the merry and joyous family circle and back of it all, the Christmas spirit, have made it so.

Many changes may have taken place during the year; familiar faces may be missing, and there may be the vacant chair, yet the old house, the rooms, the merry voices, the smiling faces and the laughter bring back fond recollections of our childhood days, and transfer us back over many years to the happiest hours of our lives.

As this season of seasons approaches, may we express the wish that Christmas bring you happiness in full measure and overflowing, and that the New Year be filled with many blessings.

THE PUBLISHERS

A door that says "Merry Christmas"

Saying Merry Christmas

By Katherine Goeppinger

"Once more the rapid, fleeting year
Has brought old Christmas to the door;
Come, let us treat him with such cheer
As folks were wont in days of yore!"

NOVEL outdoor lighting effects for the holiday season are by no means restricted to city homes. A country home all aglow on a chilly December night presents the most inviting spectacle imaginable.

¶ Starting with the custom of lighting evergreen trees on the lawn, the idea spread to decorating the entrance and to flood lighting the entire front of the house with holiday magic.

¶ Doesn't this doorway express the hospitality within? A string of colored Christmas tree lamps twinkles on each tree and the wreath on the door glistens with burning red holly berries —simply tiny red lamps wound within the wreath!

Upper: Rugged, simple toys satisfy the tots. Lower: The moving picture machine is a toy for the whole family

Christmas
On the Farm

ETHEL MORRISON-MARSDEN

BOBBY'S demand for an electric train which he saw in a store window gave me the idea, and last year we had an electrical Christmas for all of us on the farm.

Instead of getting Bobby the cheap and flimsy little one-car outfit that he asked for, I decided to get him a more expensive, though much more durable electric transformer and train; one that he could derive much pleasure from and that would also add greatly to his knowledge of electricity; also one that would last him as long as he is interested in trains which I expect will be five more years anyway. We purchased this train, a freight train with an engine that would reverse and which had a head light, several freight cars, an oil tank car, and a dump car that would actually *dump*, and enough track for ordinary use. This latter my husband screwed onto a large piece of plaster board so that the track could not be lost or broken, and how we have rejoiced ever since at our foresight.

Bobby and His Train

During the year Bobby, aged ten, has spent many hours with his train and is learning something about electricity, which I am hoping will start him out with a little extra electrical interest in life and aid him as he grows older. For it is my firm belief that the greatest farm relief is to come from the electrical field and I want my son to learn the use of it easily. He has also accomplished a great deal by making tunnels, through which his train passes, by building depots, by making switch tracks. He has built a veritable countryside about his train track with sand, pebbles and little twigs to represent trees. Every boy around has been here and I hear that Santa has a very heavy order for electric trains from our community for this coming Christmas.

Marjory is a born little housewife and so I chose a tiny electric iron for her doll clothes and we made her a small folding ironing board to use with it. She has taken great pleasure all year in keeping her doll's clothes freshly laundered and neatly pressed and she frequently irons handkerchiefs and other small articles for me at the same time that I am doing the large pieces of my washing.

Electrical Gifts

For my sister I purchased an electric curling iron, for her hair is not curly like mine, and I did get so tired of seeing her hair straight when it was more becoming curled about her face. And for my brother I chose an electric soldering iron, for he was always rushing in with his old iron, poking it in my stove, leaving the doors ajar and the gas escaping, then rushing pell mell back to the barn to solder up an old milk can or his leaky radiator. We all chipped in and bought mother a bridge lamp to place between the radio and her easy chair in which she spends her evenings either reading or mending. It was a little harder to know what to get for my father, for I had decided by now that it must be an electrical Christmas for all. As he is more or less of an invalid and suffers greatly at times I finally had the grand inspiration to get him an electric heating pad to ease his aches and pains. And I venture to say that this brought him as much real comfort as any gift he has ever had.

It wasn't hard to get something

for my husband, for if there is one thing that he loves more than anything else it is pop-corn, and he always pops it himself. Three or four evenings a week through fall and winter months he gets out the old skillet, starts the range up and makes corn for us all. And he makes it good. So, of course, I bought him an electric corn popper. But I couldn't save it for Christmas, for several days beforehand he began popping whole bushel baskets full for the children to string and hang on the tree and for me to make pop-corn balls of, and so I gave it to him then.

A Delightful Surprise

And although I had been planning on an electrical Christmas for the rest of them, I was delightfully surprised myself, when Christmas morning broke to find that Santa had brought me the desire of my heart, an electric waffle iron! And, of course, our tree blazed forth every night lighted with many and varicolored electric bulbs, casting its reflection on the drifted snow without.

This Christmas I have not yet planned in detail, but the children are to have an electric moving picture machine. Not an expensive one, it is true, but I feel that we must provide entertainment for our children at home for the long winter evenings and I would far rather do this than have them constantly begging to go to the show in town. They can invite their little friends in for a show on Saturday afternoons, or for an occasional party.

And for my sister, who has now a tiny baby, I am planning on a motor for her sewing machine, for she has so much sewing to do, and she may also use it in many other ways. My brother needs a good flashlight with a powerful light, and mother has been wanting an electric coffee percolator for ever so long. So it looks to me like we were about to celebrate a second electric Christmas on the farm; and what could be more appropriate as we sit on Christmas Eve listening to the Christmas Carols that our radio brings to us, enjoying our tree, and chatting by the light from electric fixtures which are heavily festooned with boughs of evergreen and holly and mistletoe, than another electric Christmas!

Christmas Toys for Children

By KATHERINE GOEPPINGER

AT the holiday season the stores are flooded with play equipment of all sorts, good and bad, attractive and garish, some with a definite value for the child, others worthless and some even detrimental.

Some toys are manufactured to sell for their immediate "eye appeal," although they have no permanent worth to the child.

In order to encourage desirable habits and emotional responses, it is important to carefully choose toys especially adapted to the par-

Trying her ingenuity.

ticular child for whom they are selected.

Blocks of various types are suitable for children from one to six years. Few toys are better adapted for two or more children to play with in a group than building blocks. The child learns to cooperate, to be industrious, resouceful, orderly and to respect the rights of others.

Blocks should be made of wood that has sufficient weight to give stability in building; close grained to permit washing without permanent injury. The corners should be rounded for safety and comfort.

Nursery schools have simple play equipment that is adapted to the child's level of maturity and at the same time will encourage development. The older children are given various sizes and shapes of blocks for building equipment, also novelty blocks with pegs that can be assembled into imaginary animals, trains and other forms.

The colored porcupine blocks illustrated are the idea of a nursery school teacher and they were designed by her for children from two to four years old.

"There was an old woman
Who lived in a shoe,
She had so many children
She hardly knew what to do,
But instead of giving them
Broth without bread,
And whipping them soundly
And sending to bed,
She gave them some blocks
With which to play,
And then all her children
Were happy and gay."

For children of larger growth there are toys in bigger variety. Among these may be mentioned two which are becoming particularly popular on electrified farms—the electric train and the motion picture machine.

Dollars In Drinking Cups

Providing dairy cows with free access to water in drinking cups in the barn increases the milk and butterfat production, according to results of an experiment at Iowa State College the past winter. Dr. C. Y. Cannon, head of the dairy husbandry department, announced the results at the recent meeting of American Dairy Science association stating that cows given free access to drinking cups produced 6.14 per cent more milk and 12.12 per cent more butter fat than those offered water twice a day at outside drinking troughs. The cows getting water from the cups drank 18.37 per cent more water than when watered outside.

It was also reported that cows having free access to water in the cups cleaned up their feed better than those watered outside. Cows having access to the cups drank an average of 10.3 times during the 24-hour period.

The above results would indicate that thousands of dairymen could profitably install drinking cups and a water system under pressure which would not only pay for itself but also remove much of the drudgery from their tasks.

The Night Light for Baby Chicks

The favorable results secured by a large number of poultry raisers with the use of a dim light for baby chicks are being confirmed by experiments at the Massachusetts Agricultural College. Prof. Wm. C. Sanctuary reports that with 327 chicks under observation, the lighted chicks showed a gain in growth at four weeks of age which varied from 8 to 15 per cent, depending upon the breed. This gain did not come from eating during the night, but it was noted that the dim light kept the chicks spread out in the most comfortable sleeping belt available and enabled them to find their way back to the hover without becoming chilled. It was also observed that on cold mornings the lighted group of chicks lost no time before starting to drink and eat, while a large portion of those in the unlighted group first took time off to get warm under the hover.

Where electricity is available a light was recommended. This assures a dependable light which will not blow out or become an extra fire hazard.

12 more eggs *per hen*

By J. C. Scott

IS it worth while for the poultryman with, say, one thousand layers to consider something that will increase his profit, possibly $400 during the winter? If so, the experience of some of the commercial egg producers of Western Washington should be valuable.

Mr. L. C. Beall, Vashon, Washington, a poultryman well known among white Leghorn breeders throughout North America, a few years ago found that by keeping plenty of fresh, warm water for his flocks at all times in winter, especially during the cold snaps, the layers would produce from ten to 20 eggs more per hen. Many other poultrymen have found the same to be true.

To be conservative then, it can safely be estimated that the proper watering of layers in winter means an increase in production of twelve eggs per hen per year. And to the poultryman with one thousand hens it may be worth at least $400 in real money.

Don't Blame the Weather

It has always been known among poultrymen of course, that a cold spell of weather in winter brings on a decided slump in egg production. This has generally been blamed on the cold weather, a thing that could not be avoided. We are beginning to realize that while the cold weather can not be avoided, the let down in egg production can.

Heavy producing hens must drink large quantities of water. Now it is natural to suppose that

anything which causes these layers to drink less water, immediately affects egg production. Experience proves this is true. It also proves that when egg production goes down in winter, it is very difficult, if not impossible, to bring it back to normal. So the importance of preventing these slumps during the winter can not be over emphasized.

Proper Temperature Desirable

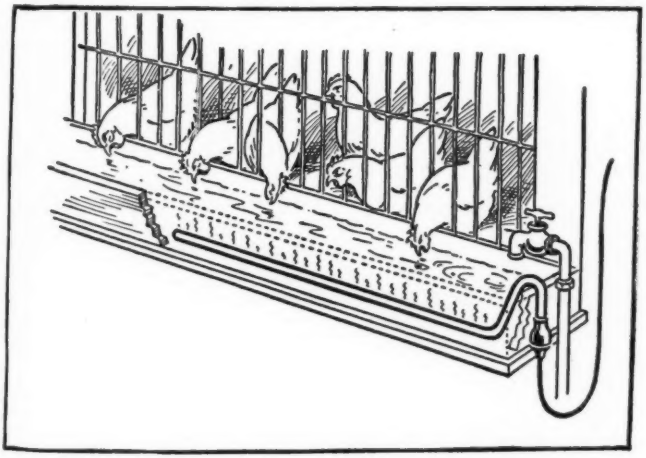
It is not necessary or even desirable to have drinking water for the layers too warm. The hens drink their maximum amount of water when its temperature is about 50 degrees F. It is not until the water drops below 40 degrees that there is a marked decrease in its consumption amounting to 20 to 25% when the temperature is close to freezing. To provide warm water we devised a low wattage electric heater to be laid in the water trough. This heater is made up in different lengths, usually four to six feet long, and sometimes circular to go in round water containers. It is also made in different wattages, from 75 to 200 watts. The wattage required will depend upon the climatic conditions of the territory where used and the construction of the laying house, also where the trough is located in the laying house.

Since the heater is simply laid in the trough, it is easily removed for cleaning or when not needed.

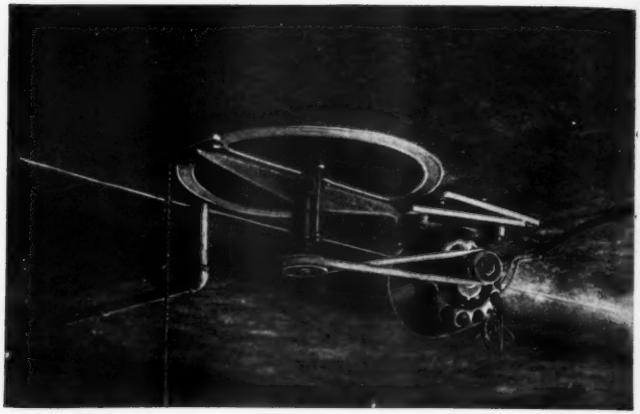
The cost of operation depends upon the wattage of the heater, but is negligible in comparison to the increased egg production it is responsible for.

The principal advantage of the electric water warmer in the hen house, as told by one poultryman in Western Washington, "is not only its saving a tremendous amount of bother in carrying warm water, but its assurance that the layers always have warm water. When they have to depend upon us to carry them warm water it is cold or frozen up half the time because we are busy doing something else or just forget it."

"Laugh and grow young," says a Detroit physician in a recent newspaper article. Which, everything considered, might well be amended to read: "Laugh at the wrong time and never grow old."



A heater that keeps the ice out of the tank



An early model of forced draft outtake flue

There are diverse views on

Dairy Ventilation

By E. R. Meacham

So much of our progress lies along the zigzag course of trial and error that we often stumble upon our improvements by accident. Then we pick up the new method, try to apply it to all sorts of situations regardless of conditions, develop opposing theories to explain and account for it, and lose ourselves in ceaseless argument while still continuing to use in a blundering fashion something we know very little about. This has been especially true about ventilation. All animal life since the day of creation has depended upon oxygen, yet it was only 156 years ago that Priestly discovered its existence. Then began the war of words about ventilation that has raged unceasingly down to the present day. Now within recent years, since we have turned our attention so generally toward the use of electric power on the farm, methods of using it to provide adequate and economical ventilation are being developed.

During the past year some interesting and authentic information on ventilation has appeared. The United States Department of Agriculture has published Technical Bulletin No. 187, "The Ventilation of Farm Barns," by M. A. R. Kelley. In the April, 1930, issue of the Journal of the American Society of Agricultural Engineers

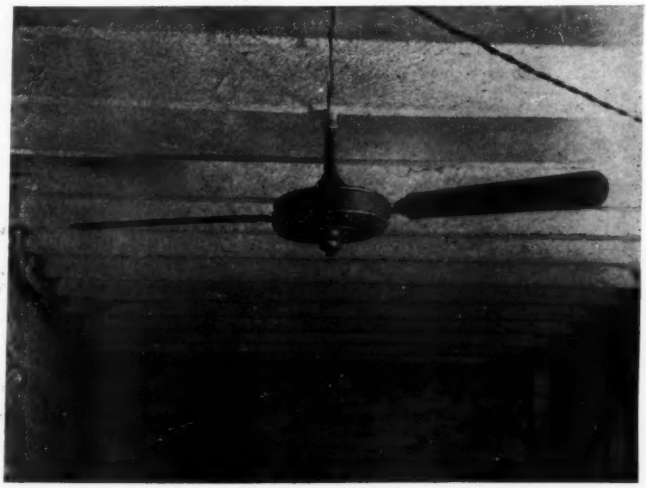
there is a long and instructive article on how to ventilate with electric power. At the Wisconsin Rural Electrification Short Course this fall Mr. J. L. Strahan read a paper that threw more light on the subject.

Aim of Ventilation

The authorities all agree that the aim of ventilation is to provide a healthful atmosphere in which the cow can carry on her work of milk production. Disagreement begins with the question of what a healthful atmosphere is. We can only take refuge in the generality that it should be pure, not too moist and not too cold.

Mr. Kelley points out that several very serious misconceptions have arisen about air purity. Because carbon dioxide is produced in the lungs and breathed out with the air, the amount present in stable air has been taken as a measure of satisfactory ventilation. People have been taught that its presence in poorly ventilated places has a poisonous effect. Some believe that 1% of carbon dioxide in stable air is fatal to animals. Another common error is that because carbon dioxide is heavier than normal air, the breath breathed out by an animal will settle to the floor. The facts are that careful investigators have not been able to discover any injurious effects from the amount of carbon dioxide that would be present even in a very poorly ventilated stable, nor have they been able tc discover any other organic poisor in the exhaled air.

The United States Bulletin referred to points out that because the air has been warmed in the cow's lungs and some of its oxygen has been replaced by water vapor which is considerably lighter, the air breathed out of a cow's nostrils will rise instead of fall if the temperature in the stable is not more than 80°, which is really pretty warm. As a result, it often happens that the air at the ceiling has a higher carbon dioxide content than at the floor which we have long been taught to believe was most impure. All of which means that if we can maintain the other two factors, namely, proper temperature and not too much moisture, we need not be very much concerned about air purity,



Merely circulating the air within the barn is an advantage to men and animals

as it will probably take care of itself.

The problem of removing moisture from the barn cannot be disposed of so easily. Since it is important, it will be worth our while to examine for a moment the basic principals involved. Moisture and frost on the walls are commonly taken as an indication of poor ventilation, but this is often unfair to the system. As will be shown later in discussing the control of temperature in the barn, there are often better and cheaper ways of avoiding this condensation. As a matter of fact, under some conditions removing this moisture by passing larger quantities of air through the barn by means of our ventilation system, would cool off the interior of the barn to such an extent that the condensation would actually increase instead of disappear.

Banish Moisture Laden Air

The average milk cow breathes out from 12 to 18 pounds of moisture per day, or about 1½ to 2 gallons of water. There is only one way to dispose of this water, which in a barn containing 20 cows, amounts to a considerable quantity. That way is to carry it off in the stream of air passing through the ventilating system, while maintaining the comfort and economical production of the cows. The temperature of the barn is very important for the amount of moisture the air can hold depends directly on its temperature. It can hold much more when it is warm than when it is cold.

This is the fundamental fact on which our problem can be solved, if at all.

The air is warmer when it leaves the stable than when it enters the stable, and for that reason can carry out more moisture than it can possibly carry in. The colder it is when it enters the stable, the more moisture it can absorb when it has become warmed to stable temperature. That means that it requires considerably less air movement in very cold weather to keep a barn dry than is required when the temperatures outdoors and in the barn are more nearly alike.

That uncovers the important difference between mechanical and natural systems of ventilation. The natural system, you will remember, depends entirely for its action upon the difference in temperature and, therefore, the difference in weight between outdoor air and that in the outtake flue. You have noticed that when the weather is mild outdoors and particularly if it is rather damp, the flow of air in the flues of the natural draft system is rather sluggish. That is because the outdoor air is almost as light as the air in the flue, and there is, consequently, little difference in pressure to cause a flow. However, this is just the time when maximum movement of air is desirable, for since the incoming air is already damp and warm, its temperature cannot be raised very much while in the stable, and it can, therefore, absorb very little of the moisture exhaled by the cows. Since each cubic foot can take up so little, it becomes necessary to increase the number of cubic feet passed through the stable.

On the other hand, in clear, cold weather, when the outdoor temperature is down to zero or away below, the draft in a natural system of ventilation reaches its maximum, carrying off more air than is necessary to take up the moisture produced and with it more heat than the cows can afford to lose.

Milk Production Affected

After all, the only heat in an ordinary barn is that produced by the feed eaten, and if the temperature falls too low, feed that should go for milk production must be used for warmth. To be sure, a certain amount of it is used for that purpose under any condition, and the more a cow is fed, the colder weather she can endure without drawing upon her reserve stores of energy.

This leads to a conclusion that is rather opposed to commonly accepted ideas. Cows on heavy milk production with consequent heavy feeding do not require as warm a barn as dry cows on a ration de-

signed for maintenance solely. Authorities quoted by the United States Department of Agriculture indicate that cows on maintenance rations should be kept in a temperature no lower than about 50°, while heavily fed milk producers can endure 40° without harm.

Thermostat Control

From what has been said about moisture, it should be evident that it is reasonable to design any ventilation system, either natural or mechanical so that the air flow can be restricted in extremely cold weather and increased when the weather is warm. In the case of the natural gravity system this can of course be done with dampers, but as pointed out before, any such attempt to restrict the flow is in direct opposition to its natural tendency. On the other hand electric systems of ventilation can be and are now made so that they will take care of this feature automatically by means of a thermostat. The thermostat doesn't have to be told to open the damper or close the damper or start the fan or stop it. It doesn't have to remember, for it is an instrument that reacts to temperature variation without thinking.

The question still remains, can we get this moisture out of the barn and enough fresh air into it without making it uncomfortably cold and freezing up our drinking cups and water systems? After all, that is the real test. No one is going to risk freezing his pipes or having his cows all humped up and shivering. The fact is that the design and construction of the barn itself and the amount and kind of stock it contains are fully as important as the design and operation of the ventilating system. Under winter conditions practically all the heat in the barn comes from the animals. All that passes out by conduction through the walls, windows, doors and ceiling is totally wasted, for it produces no beneficial effect. There must be enough heat left to continually heat to the desirable stable temperature all of the air that the ventilating system is carrying out of the barn. If the weather outdoors is very cold, the air that comes in must be heated through a temperature range of many degrees. But as I pointed out when discussing moisture, it is not necessary then to heat so large a volume of air. When the temperature outside more nearly approaches stable temperature, the heat added to each cubic foot brought in will be less, but it may be necessary to heat more cubic feet in order to absorb the moisture which the cows are exhaling. Whatever the conditions, this heat is usefully employed in making the ventilation system successful and it is, therefore, extremely important that the waste of heat be held down so that there will be plenty left for this purpose. In every-day language, that requires a tight, well built, warm

Northern winters present a real problem in ventilation

barn and under ordinary conditions it also demands that the barn be reasonably well filled with stock. Let me illustrate:

If, in a good, well built barn, that will possibly hold 30 cows, you put 10 cows, those 10 cows will have to supply all of the heat that is lost through the walls and windows and doors of the whole barn and the heat lost per cow will, naturally, be three times as great as it would be if the barn were full. The results may be that without any ventilation, whatever, the barn is too cold for comfort and it is quite natural to assume that in cold weather there will be very little heat left to warm the air which should be removed for proper ventilation.

The First Step

The first step, therefore, toward attaining success with any ventilating system is to make your barn tight and warm. The Department of Agriculture says that one-half inch of good, insulating material added to a masonry wall may decrease the heat loss as much as 50%. Two, one-half inch layers of any material separated slightly, have a greater resistance to the flow of heat than a one-inch layer of the same material. It is also important that the insulation be placed on the inner or warm side of the barn wall where it is more effective.

Each unit of heat, called a British Thermal Unit or B.T.U., that you are able to save by good construction and insulation will do just so much work. It will raise the temperature of one cubic foot of air about 50°. For example, when the thermometer outdoors shows 10° below zero each B.T.U. will bring one cubic foot of air entering the stable up to about 40°. If then you have enough stock for the size of the barn and if you save the heat they produce so that you have left for warming the air, say 1,800 B.T.U. per hour for each cow, you can bring in about 1,800 cubic feet of fresh air per hour for each cow without cooling the barn below 40°.

While this is only about half as much air as the usual recommendations call for, it is all that can be warmed under these conditions. A ventilation system that carries away any more during such cold weather will cool the barn too much.

Consider These Facts

Ventilation problems will be easier to solve if the following facts are kept in mind:

1. Carbon dioxide as ordinarily found in stable air is not the dangerous and evil thing that it has been pictured.
2. It does not settle to the floor.
3. Damp walls are not necessarily due to improper ventilavtion. They may result from having too few animals in the barn to produce heat or from losing too much of the heat through poor construction
4. Large volume of air space per animal is not a substitute for ventilation. On the contrary, allowing too much room makes proper ventilation difficult and sometimes impossible.
5. Well-constructed walls with effective insulation, storm sash, storm doors, and protected ceiling are essential to success with any ventilating system.
6. Adequate temperature control through ventilation can be obtained in any stable that provides and saves the proper amount of heat.
7. The electric method offers a more flexible means of controlling temperature conditions automatically than does the natural draft system. Furthermore, the electric is less expensive to install because in most instances it does not include any outake flue and possibly fewer intake openings.
8. The cost of operation is very slight. The electric systems installed in the barns of the Wisconsin and the Iowa Experiment Stations have shown a current cost considerably less than one-half cent per day per cow.

With electricity becoming common on dairy farms several manufacturers are preparing to supply equipment for this purpose.

Giving the Plants

A Running Start

By Herbert Collin

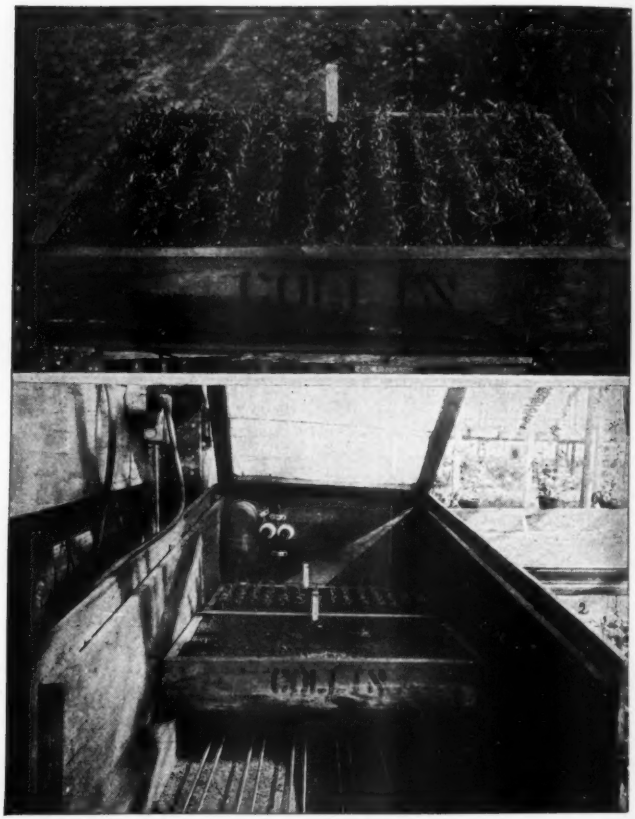
The author of this article is the owner and operator of a ten-acre flower and truck farm near Centerline, Michigan. His description of the methods he employed in solving problems by the use of electric current will be found most interesting. This is the first of two articles by Mr. Collin, the second of which will appear in our January issue.—Editor.

MY experiments with electrical equipment started in the neighborhood of four years ago. Not being able to be home to take care of my hotbeds as I should, and having the detrimental effects of drought, heat, improper ventilation and so forth, I got the idea of trying to work into a sort of greenhouse. At the present time the "old shack," as we term it, is still over there. I had only a common stove in there for heating, and the plants did not grow as they should with proper heating.

In trying to grow my plants from cuttings and from seed, I had considerable trouble, and the idea struck me of trying to put in electric heating to overcome that which I could not do by only furnace heat. At that time I happened to get hold of a pamphlet, or magazine, that stated that the College of the State of Washington had been experimenting with electric hotbeds. It put me right to work. I wanted something of that sort to work for me. I wrote the College at Washington and received their pamphlet, but it was an entirely different proposition than that which I had in mind; it carried a different line of work. I also read of a pamphlet printed by the United States Government from Washington, D. C. I sent there, but it did not contain the information that I wanted, so I thought the next best bet would be to go to the Detroit Edison Company—they were producing electric power and possibly could put me on the right track. I went over to their office in Centerline and inquired about what they would recommend. The men here in this office were office men and not field representatives. They did not know my requirements, so I kept on inquiring and hunting around to get what information I could, with no success.

In Search of Data

I went back to the Detroit Edison Company again and they stated that if they could get any information for me they would, and every now and then when I went into their office to pay my electric bills I inquired but they had no information. One day I went over there to see about a certain type of wire—what its name was and how it was constructed, and what I could do with it. The man in charge of the office at Mt. Clemens said: "We are not equipped, at the present time, to give you this information, but we are going to put a man in the field—a farm service man—who will be able to give you the information. If he hasn't this information at the time you speak to him, he will know where he can get it"—and that was what I wanted. It was but a



Upper: This flat contains 1,600 tomato plants, electrically germinated from seed in only five days. Electric heat makes young plants independent of sun or room temperature.

Lower: A three-flat germinator heated by a 300 watt unit. Lumber, wiring and temperature control cost about $20.00. Cost 15 cents to run for April. Has handled 2,000,000 plants in five months.

few days after that when Mr. Mason was sent over to me from the Detroit office. He came to find out what it was that I had under my hat that wasn't working. We finally got the electric current out to the shack. The wire we needed at that time was Nichrome wire practically the same as that used in the construction of a burner in the element on the stoves today, but I didn't know where to get it. I told Mr. Mason what I wanted this for—what I was trying to do—and Mr. Mason said, "I'll get you some of that wire, and we'll make up such an element as you have in mind and see what it will do." That was the start of our experimental work. Mr. Mason got some wire and got busy at the Mt. Clemens office, put up a rack for winding the coils, some of which you can see in the greenhouse, and made up some coils.

Units Improved

During that time I was constructing the box to house these coils and I worked out what we call a "seed germinator." It is not the germinator we have at the present time. The one on exhibition is really our third effort. The first and second performed satisfactorily, but we felt at the time that we could improve on what we had made, and the third effort is really an improvement over the first and second. At the time I made my first one in the old shack, and I found that I was getting much better results—more satisfactory results—than I could from the hotbeds, and there were a few more ideas I wanted to develop. I wanted to find out why I couldn't use the same heat for cuttings.

Here I ran against a few snags which I didn't realize at the time. I still saw ways of building our second germinator and using the first as an experiment—and believe me, it was some experiment. The number of cuttings we lost was a crime. But I wasn't satisfied to let the matter drop at that. Finally, I dismantled the germinator I was using for the cutting experiment and built the third germinator. This third one has been in continuous use this year from the first day of January until the present day, with the possible exception of two or three weeks, and the cost of operation of that bed from January 1, when the weather was cool, until the present time when the weather is warm, is less than one cent each day. This is quite reasonable when we figure that we get possibly 60% better germination in seeds than in the old style method of bench germination. We tried the second set for cuttings until I got thoroughly disgusted. I worked with it, I slept with it, and I woke up with it—still it didn't go for me. So it ran along for some time, and I had been working pretty hard in the field, was tired out, and went to bed one night rather early. My wife calls me a "pillow planner," and I guess I am! I went to bed before she did, and I was so nearly asleep that I didn't remember when she came to bed, but she says that she had just come to bed when I sat up with the idea of the present cutting bench which we have here. Why, I was just about as rested as anyone could be who has had a full night's sleep—no more sleep for me! Next morning, about as early as I dared, I called Mr. Mason out of bed. I said, "When can you get down here with more material? I have a cutting bench all worked out and I think it will be a success." He said he would come down the next day. In the meantime, I was getting my plans worked out. We put up the same type as we now have, but only two sections long. The sections each contained two or three heating elements. Mr. Mason got down here and we put the heating elements in there and I started rooting the cuttings.

Hastens Root Growth

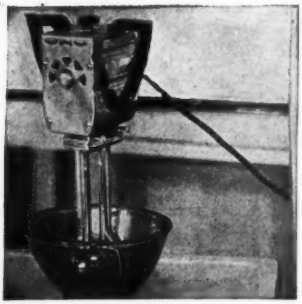
Before that time I had had no success in rooting double petunias. When I put them in the new bench they yielded about 95% to 98%—quite an improvement over nothing. I have put a cutting in there and drawn it out in a few days with a clump of roots on it. In the old style flats without the bottom heat,

(Continued on page 40)

ELECTRICAL HOUSEKEEPING

Conducted by GAIL MEREDITH

Merry Christmas



Bethlehem

O little Town of Bethlehem!
How still we see thee lie;
Above thy deep and dreamless sleep
The silent stars go by;
Yet in thy dark streets shineth
The everlasting Light;
The hopes and fears of all the years
Are met in thee tonight.

For Christ is born of Mary
And gathered all above,
While mortals sleep, the angels keep
Their watch of wondering love.
O morning stars together
Proclaim the holy birth,
And praises sing to God the King
And peace to men on earth.

How silently, how silently,
The wondrous gift is given,
So God imparts to human hearts
The blessings of His heaven.
No ear may hear His coming
But in this world of sin,
Where meek souls will receive Him still,
The dear Christ enters in.

O Holy Child of Bethlehem,
Descend to us we pray;
Cast out our sin, and enter in,
Be born in us to-day,
We hear the Christmas angels
The great glad tidings tell;
Oh, come to us, abide with us,
Our Lord Emmanuel.

—Phillips Brooks.

To Husbands Everywhere

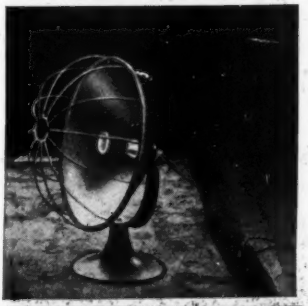
IF you can't imagine what to give your wife for Christmas, stop in at the electric store some day, and prowl around among the things they have to show you there.

Some husbands give their wives new ranges, a washing machine, or a refrigerator. I knew one last year who gave his wife a water system, and I have seldom seen a woman enjoy a gift more. But if you have already given her all these, you will still find plenty of things that will please her eye and lighten her work.

There is an ironing machine for one. She can sit down to this ironer and do the ironing in a fraction of the time it takes with a hand iron. You can give her time and save her strength for the years to come through this gift.

If you like coffee, there are several kinds of coffee percolators that will make your coffee right on the table, keep it piping hot, and let you have seconds or thirds, without anybody's running to the kitchen.

There are toasters of all kinds, flat, upright, and slant wise. They all make good crisp toast. Selecting one is a matter of individual choice. Be sure to look at the kind that minds itself if you have several small children that are apt to distract their mother's attention during toast making. She can put the bread in, press a lever, and for-



get it. When the toast is done, it will bob up itself, brown and hot, ready to eat.

There are beaters of various sorts that run by electricity instead of elbow grease. Perhaps she would like one of them.

The small egg cookers that cook eggs in live steam are a comforting gift to the family that enjoys boiled eggs. You can get them in several colors, so they are really quite gay.

Then there are waffle irons. If you think you like griddle cakes, you are going to be enthusiastic over waffles. Golden brown, crisp and crunchy, they play havoc with anyone's firmest intention not to over eat.

The small portable heaters or fleecy warming pads, heated by electric current flowing through flexible wires, will grace any tree.

* * *

Fresh Cake

ONE of the happy things about the Christmas holidays is the informal visiting that goes on among neighbors and friends. Sometimes half a dozen folks call up to say they are coming over this evening if we are going to be home; sometimes they come without telephoning. Whichever way it is, our housewifely thoughts go

scurrying towards the kitchen wondering what we can give them to eat, for feeding our friends is a traditional gesture of hospitality.

If you are saving your fruit cake for the holidays themselves; if you want something not too rich, but light and lovely and easy to eat, you may like to try this simple cake.

A friend of mine made it before my dazed eyes one afternoon last summer when a group of unexpected guests dropped in on her to sit and sew on the porch. I had followed her to the kitchen for a drink of water, and I was surprised to see her snatch a couple of eggs and a jar of cream from the refrigerator.

"Whatever are you going to do?" I asked.

"Hush!" she said with a nervous glance through the kitchen door, "I am going to make a cake."

"A cake," I exclaimed. Oh, don't bother."

"It won't take but a jiffy," she said, turning the regulator on the oven of her electric range to 350° and snapping the current on. "You'll see."

"Can I help you?"

"I'd be glad to have you grease the tin. She broke two eggs in a cup and filled the cup with thin cream. She turned this mixture into a bowl, connected her electric beater and set it to beating the eggs and cream while she measured out a cup of sugar. Then she put the sugar, a teaspoon of salt and half a teaspoon of vanilla into the bowl with the eggs and cream and beat them all up together while she shifted and measured a cup of flour. After adding one teaspoon of baking powder to the flour, she put that, too, in the bowl and let the beater finish the job.

I did not time her. I wish I had, but it certainly seemed like no time till that cake was in the oven.

"Four o'clock. In half an hour that will come out," she said as she closed the door. "Now for the frosting."

The frosting was quite as simple. She put the juice of a large orange and two tablespoons of butter into a pan and brought them to a boil. Then she beat in powdered sugar until the frosting was the right consistency to spread.

While she was doing that I made lemonade, and got out napkins and plates and glasses. We drifted in

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YOUR LABOR COSTS	LOW
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to speak to the guests now and again, but they were discussing the plans for beautifying our school yard, but I doubt if they really missed us.

When the clock said four-thirty, the cake came out plump and delicately brown. Esther set it on a rack to cool while she put the finishing touches on the trays. When the ice cubes were tinkling in the glasses, and she couldn't put it off another minute she spread the frosting on the cake and cut it in generous squares.

"I didn't think you could cut it while it was still warm," I marveled.

"I'd rather let it cool," she answered. "But I've used it more than once right out of the oven. It's pretty good even that way."

"Mm" sniffed the party on the porch. "I do declare. Fresh cake."

· · · OUR NEIGHBORS · · ·

The Kitchen Band

THIS is the Kitchen Band of the Milton Grange. I heard them play last fall at the 4-H Club Fair in Janesville, Wisconsin. We were sitting in the grandstand watching the afternoon's program. The slow horse race was just over, and the girls' bicycle race had not yet begun when they came swinging along before the crowd to the strains of a spirited march. All of the entertainment at the fair, you must know, came from the communities round about, and all of it was doubly interesting because folks knew the participants, racers or players as the case might be.

The leader of the band, Mrs. Frank Weber, of Milton Junction, marched gaily at the head beating a galvanized tub with a potato masher. Her hat was a two-quart pail with a milk bottle brush cockade at the side. The others wore shallow pans or kettle covers on their heads. The rest of their costume was quite simple, an immaculate white apron dress.

Easily Constructed

The instruments were made by putting a kazoo, one of those little musical devices you hum into, on the spout of a coffee pot, the end of a faucet, or on the handles of a flour sifter or corn popper. A few women with a handful of kazoos can make a surprising swirl of music.

They played several pieces—each familiar to the crowd, and each received with hilarious applause.

If you need some new stunt for one of your meetings, the women of the Milton Grange would prob-

TURN A SWITCH *to hatch chicks!*

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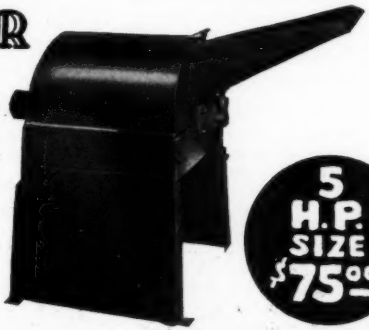

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Everyone knows some farm woman that the rest of us would be interested in. If you do, won't you write me about her for OUR NEIGHBORS *column? If she does something unusual or interesting, tell us about that. Tell us everything you can think of about her. Yes, gossip as much as you like. If you can get a picture of her, or her activities, send that too.*
GAIL MEREDITH

ably be glad to have you study the picture to get suggestions for a band of your own. I am sure they would want you to notice the frying pan guitar, and the slide trombone effect a corn popper gives.

I saw a band like this one time that had evolved a harp from a vacuum cleaner, a mop and a broom, with a ball of twine for strings, of course. It added nothing to the music but it was funny to look at.

Bright-Colored Wraps Protect the Children

BRIGHT-COLORED clothing is a protection to little children, as well as a source of pleasure to them, the Bureau of Home Economics of the United States Department of Agriculture points out in a recent publication on play suits. The bureau recommends making these garments in vivid colors, and suggests that the same idea may be applied to their coats or other outer garments because of traffic dangers. Of course it is desirable to keep all children out of the streets as much as possible, but in large cities there is often no other open-air place for them to play. In any locality it is at times necessary for them to cross streets where automobiles are numerous, and it is then that they are endangered by the inconspicuous colors usually worn.

Motorists often fail to see children wearing coats of gray, tan, brown, navy blue, and black, because these colors blend in with the background; whereas a coat of red, orange, bright blue, or green would draw attention to the child in time to prevent accident.

The American Automobile Association in Washington, D. C., has recently taken a significant step in this direction by furnishing 2,000 yellow rubber rain capes and hats to the schoolboy traffic aids of the Capital, and is encouraging the idea in its affiliated clubs.

The same principle has long been carried out in children's bathing suits. For safety's sake let the child delight in a suit of bright color, so that his whereabouts can always be seen from the shore in time to stop him from dangerous experiments in deep waters.

Good Judgment

Teacher—Now, Bobby, which would you rather have—one apple or two halves?

Bobby—Two halves.

Teacher—Oh, Bobby! Why should you prefer two halves?

Bobby—Because then I could see if it was bad inside.

* * *

"This is my car, and what I say about it goes!" shouted the motorist, who thought he knew all about automobiles.

The mechanic crawled out from beneath the broken down machine: "That's fine! If what you say about it goes, just say 'engine!'"

* * *

Modern version of an old rhyme:

"Where are you going, my pretty maid?"

"I am going to oil the bearings on the electric milking machine, sir," she said.—Ex.

* * *

Wrap the Holes

Teacher—Can anyone tell me how macaroni is made?

Johnny—First you take a big long hole and then you wrap some dough around it.

* * *

No Crime

Judge—Your wife says you have her terrorized.

Prisoner—Honestly, your honor, I—

Judge—I am not asking this in my official capacity, but as man to man, how do you do it?

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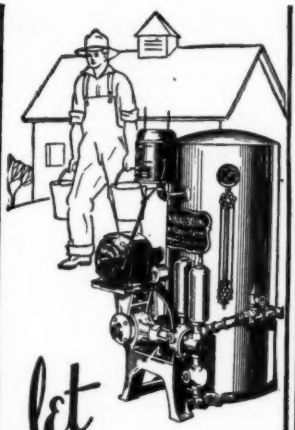

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Helping the Stock to Drink More Water

In Icy Weather

By Hobart Beresford

AN early application of stock tank water heating by means of electrical equipment occurred on the Aberdeen Substation of the Agricultural Experiment Station of the University of Idaho. Mr. A. E. McClymonds, Superintendent of the Substation farm, reports that the first installation was made in 1925 with a 750 watt immersion type heater. This heater was used in a 250 gallon galvanized stock tank for heating between 100 and 125 gallons per day in the fattening lamb pens during the winter months. The accompanying diagram shows the method used by Mr. McClymonds for taking care of the wiring and making the electrical connections waterproof. A total of twelve months' records are available for this installation. The 750 watt element was used two years, after which, due to a defect in the element, it was replaced by a 1,000 watt unit. Mr. McClymonds states that he favored the use of the 1,000 watt heater instead of the 750 watt due to the fact that the water would heat more quickly and that there would be less likelihood of leaving the heater turned on longer than was necessary.

Energy Consumption

The first three months' period that the 750 watt element was used the energy consumption averaged 90.7 kilowatt hours per month, with a minimum energy requirement of 10 and a maximum of 137 kilowatt hours. During the 1926-27 season the heater was used two months, averaging 244 kilowatt hours per month for the period. During 1927-28 the 1,000 watt heater was in service four months with an average energy consumption of 279 kilowatt hours per month. During the extremely cold weather of the first three months of the 1928-29 season the energy consumption averaged 401 kilowatt hours per month. For the 12 months' record of this stock tank water heater installation, the average energy consumption per month has been 256.75 kilowatt hours, during which time it is estimated that 40,000 gallons of water have been kept well above the freezing temperature.

The water tank in which this heater was used supplied the lamb feeding unit on the experiment station farm and in regard to the satisfaction secured from the servoce rendered by the equipment Mr. McClymonds says: "I think it is a very successful method of heating water and the lambs certainly appreciate the warm water; in addition it also saves a lot of chopping of ice which is necessary where no water heater is used.

Recommended Installation

An electrical stock tank water heater installation as recommended by the Department of Agricultural Engineering, University of Idaho, is shown in detail on the diagram. Due to the fact that the heater used is the immersion type, certain precautions must be observed in order to prevent the electrical circuit coming into contact with the drinking water. If this condition should occur we would have what is known as a short circuit with the water in the tank and the ground. Livestock attempting to drink water under these conditions would be severely shocked, if not electrocuted. However, if the following precautions are used in making the installations there is very little danger.

The wires leading from the in-

—BUT NONE LIKE THIS

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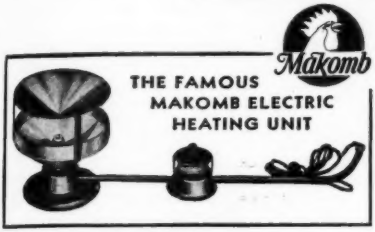

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describing Stewart, the most complete line of Clipping Machines, both hand models and power operated types.

We can adapt your hand clippers and shearing machines for use with motor for $5.50. Write for particulars.

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World's Largest Makers of Clipping and Shearing Machines

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Complete Water Systems

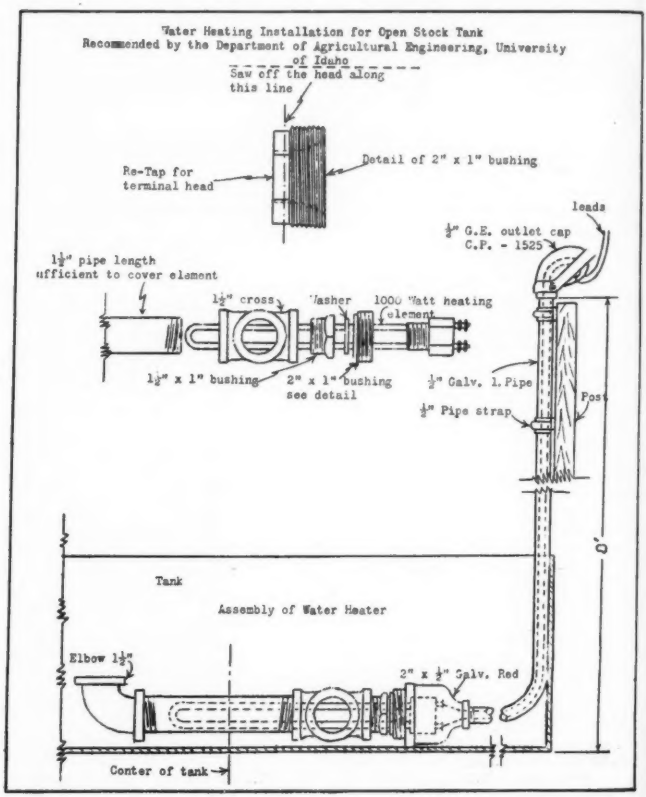
Write for Literature on Either or All.

THE LAUSON CORPORATION
700 Michigan St., New Holstein, Wis.

stallation to the water heater circuit should be at least 8 feet in the clear at the tank unless the feed wires can be led in along the wall of a protecting building. Drip loops in the wires and a waterproof cap should be provided on the top end of the half-inch galvanized pipe. Where the stock tank is located in the open a post should be set at the end of the tank for supporting the conduit, which may be fastened to the post by means of pipe straps.

The bottom end of the conduit pipe is bent at right angles in order that the heater assembly may lay flat on the tank bottom. Before the feed wires are inserted into the conduit they should be given as many left hand twists as will be required for screwing the conduit into the heater assembly. A two-inch to a half-inch galvanized reducing coupling is used to attach the heater element assembly to the conduit. A two-inch to a one-inch flush bushing is reversed tapped on the inside and the head section of the bushing cut off with a hack saw. This will permit the thermal head of the heater to be screwed through the bushing and

(*Continued on page* 40)


Water Heating Installation for Open Stock Tank
Recommended by the Department of Agricultural Engineering, University of Idaho
Saw off the head along this line
Re-Tap for terminal head
Detail of 2" x 1" bushing
Leads
½" G.E. outlet cap C.P. - 1525
1½" pipe length sufficient to cover element
1½" cross
Washer
1000 Watt heating element
1½" x 1" bushing
2" x 1" bushing see detail
½" Galv. I. Pipe
Post
½" Pipe strap
Tank
Assembly of Water Heater
Elbow 1½"
2" x ½" Galv. Red
Center of tank
0'

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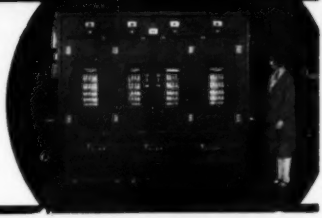

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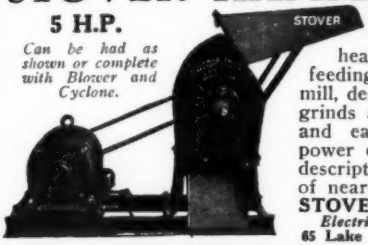
5 H.P.

Can be had as shown or complete with Blower and Cyclone.



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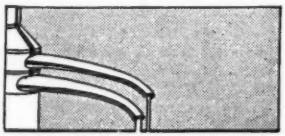

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Questions and Answers

Conducted by
H. J. GALLAGHER
Agricultural Engineering Dept.
Michigan State College

Note—Readers are invited to send in questions which will be answered in the order received.

Question: *I have a new International Harvester No. 12 Ensilage cutter, can this cutter be run by a 5 H.P. electric motor? If so, what size should the pulleys on motor and cutter be? Would a 100 ampere entrance be large enough to cover all requirements on a farm? What size wires carrying 220 volts should be used for a 5 H.P. motor, the distance being about 300 feet from entrance to motor? What is the best type of motor for farm use and how should it be equipped to provide for overload release, fuses and switches? Is a short belt better than a long one for use with a motor? Is No. 12 wire heavy enough for 1 H.P. motor using 220 volts that runs a milking machine engine, and will ½ inch pipe hold two wires?*

Answer: A 5 H.P. electric motor will operate your No. 12 ensilage cutter. I have seen this cutter operate very saitsfactorily with a 5 H.P. motor. A 5½ inch pulley on the motor and a 20 inch pulley on the cutter will give the correct operating speed.

A 100 ampere entrance switch should be large enough for general farm operations. This switch is large enough to operate a 7½ H.P. motor and have reserve power left. It is large enough to operate a 5 H.P. motor, the electric range, small motors and lights at one time. Electric power, except under special conditions, becomes expensive when too large motors are used. The economic practice is to stay within the limits of 5 or 7½ H.P. single phase motors. Under these conditions, the 100 ampere service switch will prove adequate in size.

No. 6 weatherproof wires should be used to convey 220 volt service a distance of 300 feet to your 5 H.P. motor.

The best type of motor for farm use is the portable 5 H.P. motor. These motors can be purchased complete with truck, two or more pulleys, extension cable, power plug, magnetic switch and thermal overload control. The thermal overload is the protective device against overloading the motor. A motor of this type should be purchased from a reputable manufacturing company, your power company is in a position to advise you in this respect.

In general the longer belt is more satisfactory for 5 H.P. operation than is the short belt. It provides better pulley wrap without undue wear on the bearings. Where short belts are used, except V-shaped belts, the tendency is to have them too tight, and a tight belt is hard on the bearings of the driven machine. Short belts are successfully used when an idler pulley is provided to take up the slack.

No. 12 wires for a 1 H.P. motor on 220 volt service is large enough when the length of run does not exceed 60 feet. Two No. 12 wires can be used in a ½ inch pipe.

Question: *Answer the following, please, in* ELECTRICITY ON THE FARM *magazine. What size is enclosed piece of copper wire? Is this wire large enough to supply a 1 H.P. single phase A.C motor a distance of 1,500 feet.*

Answer: The wire enclosed in your letter is No. 10 B & S gauge. A standard 1 H.P. motor on 220

Front Cover Title Contest

First Prize for October — $25.00

"Carving a way for an electric ray."

R. P. Dickson, R. 6, Box 305, Ann Arbor, Mich.

The following titles have been selected as winners of the $5 cash prizes:

"An electric bulb will do the trick better than any candle stick." Paul J. Peterson, R. 4, New Richland, Minn.

"Even the Hallowe'en pumpkin will be in style, when an electric bulb illuminates his smile." Mrs. Neil J. Burke, R. 3, Winona, Minn.

"A beaming young live-wire cutting up on Hallowe'en." Mrs. J. Watson Vibert, South Windsor, Conn.

"His pumpkin will have a bulb inside; even Hallowe'en's now electrified." Miss Beulah Fitzgerald, Lovington, Va.

"When the pumpkin's turning yaller, an' the corn is in the shock; Bud dreams of Jack o'Lanterns, an' swipes a 40 watt." Mrs. Fred Broesamle, "The Evergreens," Dryden, Mich.

Rules for December Contest

For the best title to this month's front cover illustration, a cash prize of $25.00 will be awarded.

In addition, we will pay $5.00 for each of five titles given honorable mention.

In case of a tie, each winning contestant will receive the full cash prize to which he or she is entitled.

The winners will be announced in the February issue.

Only the farmers or members of the farm family, to whom this magazine was sent, are eligible.

Only one title may be submitted.

Use the form below or write your answers on a plain sheet of paper in similar form.

Be sure to answer question (a).

Write plainly and send your suggestion to the Title Editor, ELECTRICITY ON THE FARM, 24 W. 40th St., New York, before January 1.

My title for December Front Cover picture is.....

.....

.....

.....

.....

(a) Fill in the brand name for each article you now have or plan to buy.

	Make we now have	Make we plan to buy
Electric Clothes Washer.....	.....	.....
Electric Ironing Machine..... (not hand iron)	.....	.....
Electric Sewing Machine.....	.....	.....

Name..... R. F. D.....

Post Office ..... County..... State.....

volt service requires about 5 amperes of current. The voltage drop per 100 feet of No. 10 wire carrying 5 amperes is .510, a drop of 15.3 volts in the 3,000 feet of wire to and from the motor. This gives a voltage reduction regulation of 6.9 per cent and for motors it should not be over 5 per cent or 3 per cent for lights. No. 8 wires would give a voltage regulation of 4.36 per cent which would care for the motor. If lights are to be used the wire should be No. 6.

A Running Start

(*Continued from page* 25)

I would leave them there until they rotted and still there were no roots. I put geranium cuts in this bench and in eighteen days pulled them out with a clump of roots that could be placed in a 3-inch pot and have roots touching all around, which is a pretty good growth of roots. That worked out all right, was doing what I wanted, so it ran along until spring.

They had a Farmers' Week up at Michigan State College, and through some source that I didn't know, we got two tickets which said they would admit Mrs. Collins and myself to a banquet at the College for the electrification part of the farmer's work. We felt because of the experimental work we had carried on, we would like to go to the College and see what they had. While there, I went to the greenhouse to see the cutting bench in operation. It was differently constructed and according to the last reports I have heard, is not giving such beneficial and satisfactory results as those we have there.

I looked around at a lot of different things around there, and met Mr. Douglas Dow of the Detroit Office. We had a little talk, and I told him that since my cutting bench was proving so satisfactory, I would be glad to do anything I could so that others could get the benefits of the information happened upon by me, and so that the other fellow could be put a step in advance of what I was when I started to work. When I tried to explain this to Mr. Dow, he didn't say much, and I had another little talk with Mr. Mason while there. Everything was going along fine. We came back home. It wasn't very long after I got home here when Mr. Mason called me up and passed along a little information that almost took the breath away from me. He wanted to make this a demonstration farm and was wondering what we might do with certain other appliances. (But that's another story which will be told in the January issue.)

In Icy Weather

(*Continued from page* 36)

also into a one and a half-inch to one-inch bushing, to which is screwed the one and a half-inch cross. A length of one and a half-inch pipe sufficient to clear the element is added to the cross and an elbow on the end completes the assembly. The detail of the pipe fittings and conduit assembly as shown in the accompanying illustration provides both protection and a circulating shell for the heating element.

With this arrangement the cold water is admitted at the thermal head of the heater through the side openings of the cross, and is expelled through the top opening of the elbow. It is important that the thread fittings on the wiring side of the thermal head be waterproofed with white lead, and that the right angle bend in the conduit be sufficiently liberal to avoid cracking the pipe. If the heater is installed in a galvanized iron tank it is a good idea to see that the tank is thoroughly grounded. This precaution eliminates most of the danger from shock; however, with reasonable care in following the above directions little difficulty will be experienced in securing a very satisfactory stock tank water heater installation.

So Would the Rest of Us

Customer: "I'd like to see some good second-hand cars."
Salesman: "So would I."

Andis Animal Clipper

The One-Man, One Hand Clipper

No stands, trolleys or cables. Clips udders, flanks, 8 to 12 cows an hour. Satisfaction guaranteed. See dealer or write for full description and special offer.

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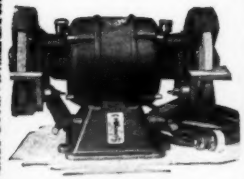
Inside Back Cover

is for your convenience

Why not use it?

MARATHON GRINDERS O.K.



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Until you actually have had one of these handy bench tools around, you can't very well appreciate how immensely useful they are.

Sharpening knives for the kitchen and for farm machinery, hatchets, axes, spades and all manner of tools —besides being first aid on many a repair job. The price is only **$35**

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With same hens, same feed you can get enough high priced winter eggs to pay big return on small investment. You CAN do it NOW on easy monthly terms.

Only 10¢ per Bird Cash Outlay

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New design gives fully insulated and ventilated (Genuine King System) house at cost of ordinary shed. Babson Farm Service Man will call on request. Write!

Babson Manufacturing Corp.
Dept. 95-19
2843 W. 19th St., Chicago

Enjoy Them All

We enjoy all the electrical appliances we have on the farm; and we have milker, washer, cleaner, cooker, iron, grill, heater, radio and lights in the house, yard, barn, milk-house, garage and hen-house; but the electric water system is my choice. The nice sink with hot and cold water, the bathroom, the milk-cooler, and water basins for the dairy; besides hydrants in the barn and hen-house, are always on the job, controlled by "this servant." Nothing can ever take the place of electricity on the farm.

THEODORE TRASK,
R. F. D. 7, Waterford, Pa.

• • •

What Greater Convenience?

If I could have but one electrical servant it would by all means be the electric pump. Water, hot or cold, for sink or bathroom, water at barn and poultry house, water for lawn, what convenience could be greater?

If I already had running water my choice would be determined by circumstances: a washing machine for the large family, a vacuum cleaner for the large house, sewing machine for much stitching, percolator, toaster, etc., for the apartment dweller, but for our farm, where much water is required, nothing could so lighten our work as the pump.

MRS. A. B. WHITE,
R. D. 1, Cortland, N. Y.

• • •

To the Rescue

Wanted: "A good hired man." Undoubtedly this has become the most important problem with the present-day farmer. Fortunately, electricity, with its many appliances, is gradually coming to the rescue.

I consider the handy motor my favorite electrical servant or "hired man" as I prefer to call it. By mounting it on wheels it can easily be moved about and become more useful. It pulls the silo filler without effort, drives the feed grinder with ease, turns the buzz saw willingly, operates the water pump readily, and performs many other important tasks both economically and efficiently. Its importance has made it a necessity.

ADAM J. BROSS,
R. F. D. 5, Ann Arbor, Mich.

Dependable and Efficient

The most dependable and efficient electrical appliance I have on the farm is the washer.

It saves the doing of a tiresome and back-breaking task; it saves time and money—important factors on any farm or elsewhere. I can do my washings in one-third of the time I ordinarily did. I save money because, since it does take less time to wash, I have more time to perform other household duties which otherwise would have to be done by some one employed by me and, best of all, I have been able to buy other electrical servants with these savings.

MRS. CLARENCE CURFISS,
R. R. 1, Amelia, Ohio.

• • •

Enthused

My interest has become enthused over the new and modern conveniences that should be in every home.

Mother always wants my help at house-cleaning time to beat the rugs. Now with this new sweeper that has such power and suction that it draws the dust that is embedded in the rug. Since we have the vacuum sweeper I have more time to spend on other things and I also use less of my strength.

Besides the vacuum cleaner may be used for other things. This makes it useful in more than one way, so it has become my favorite now. It sure seems a relief to have no more rugs to beat.

ALICE MACGOODEMOTE,
R. F. D. 1, Houghton, N. Y.

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